

*Keep w/cast.***PATENT ABSTRACTS OF JAPAN**(11)Publication number : **11-124854**(43)Date of publication of application : **11.05.1999**

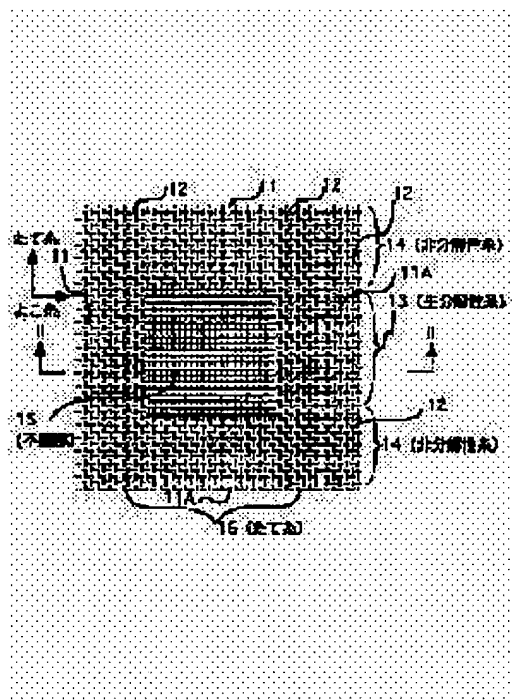
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(21)Application number : **09-307836**(71)Applicant : **TAIYO KOGYO KK**(22)Date of filing : **22.10.1997**(72)Inventor : **KOIKE MINORU****SUGIYAMA TAKANOBU****(54) CONCRETE MAT FOR GREENING****(57)Abstract:**

PROBLEM TO BE SOLVED: To provide a concrete mat using baggy forms made of cloth efficiently conducting greening for slope protection.

SOLUTION: A surface woven-fabric 11A and a rear woven-fabric are woven in a single layer and connected at greening lattice points arranged at regular intervals, and fillers are housed in the internal sections of the fabric 11A and the rear fabric under a laid state and a ground is covered. In the concrete mat for greening conducting sodding at the greening lattice points, the greening lattice points are formed in a parallel crossed shape by beltlike sections 12 woven in the single layer while warp and weft within a range surrounded by the parallel crossed shape are formed in a nonwoven fabric section 15, in which warp and weft are superposed on a surface and a rear without weaving and crossed. Biodegradable yarn is used as weft 13 crossed in the nonwoven section 15.

**LEGAL STATUS**

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the concrete mat using the letter shuttering of cloth bag manufacture used for the slope protection which starts the concrete mat for tree planting, especially enabled it to perform slope vegetation efficiently.

[0002]

[Description of the Prior Art] Slope protection work is performed for the purpose of preventing collapse by the weathering of a cut slope or the front face of inclination revetment etc. conventionally. As the example, the interior of the saccate shuttering made of cloth is filled up with concrete or mortar, and the concrete mat which covered the slope as the shape of a mat with superficial breadth is used. This kind of concrete mat opens fixed spacing, a single connection part is established, or is connected with a connecting fibre, forms a saccate building envelope so that predetermined thickness may be secured in surface textile fabrics and rear-face textile fabrics, and it fills up that interior with concrete.

[0003] By the way, when harmony with a circumference scene is taken into consideration, it is desirable to make it hide with the vegetation to which the vegetation by herbs was given to the slope where this kind of concrete mat was laid, and the whole concrete mat grew thick in it. Moreover, long-term stability of the foundation is also achieved by the root of the herbs which grew, and arbors. Drawing 10 is the partial perspective view having shown an example of the concrete mat 50 which can give such sodding planting. After being laid by the slope, the concrete mat 50 with which it filled up with mortar 52 in the shuttering 51 made of cloth finished weaving in the shape of a grid is shown in this drawing. The field palmette books 55 exposed from the grid-like space part 53 at this time bud, and the condition of having grown is shown. On this kind of concrete mat 50, vegetation base material ***** of a thin layer is performed into the grid-like space part 53 formed of mortar restoration, and the growth base 56 is developed. The thing in which acted to the vegetation base material as the subject of the soil, and various kinds of composts and a seed were made to mix generally is used.

[0004] However, as shown in drawing 10, when the big grid-like space 53 is formed, the sprayed vegetation base material will be flushed with storm sewage etc., it becomes inadequate the vegetable amount of sprouts and growing it, and there is a possibility that the function as sodding planting cannot be achieved.

[0005] In order to solve such a trouble, the concrete mat for tree planting as shown in drawing 11 R> 1 is also proposed (refer to JP,8-4018,A). Drawing 11 is ***** having shown some surface textile fabrics of the concrete mat 60. The lattice point 61 (it is hereafter described as the tree planting lattice point 61.) which performs the vegetation prepared in a mat side at the predetermined spacing as shown in this drawing consists of stomata 64 which cut off parallel-crosses-like Oribe 62 holding this configuration, expandable Oribe 63 who is surrounded by this Oribe 62 and consists of easily decomposability fiber textiles, such as rayon, and a part of this expandable Oribe 63. The tree planting lattice point 61 opens predetermined spacing in the whole textile-fabrics surface of the concrete mat 60, and is arranged in all directions. Although a vegetation base material etc. is sprayed at the tree planting

lattice point 61 of this concrete mat for tree planting, since easily decomposability fiber is not decomposed in the phase immediately after blasting, the outflow of soil, fertilizer, etc. is prevented, and easily decomposability fiber decomposes according to vegetation, and a stoma part is expanded. This also expands the vegetation possible range according to vegetation, and vegetation is not checked.

[0006]

[Problem(s) to be Solved by the Invention] On the concrete mat 60 in which the tree planting lattice point 61 shown in drawing 11 was formed, effective growth of vegetation is expectable. However, the routing in which this concrete mat 60 prepares a stoma in all the tree planting lattice points 61 in addition to a textile production process is needed. For this reason, on a concrete mat with many tree planting lattice points 61, there is a problem of leading to the cost rise as a concrete mat.

[0007] Then, it is in the purpose of this invention canceling the trouble which the Prior art mentioned above has, and offering the concrete mat for tree planting which enabled it to plant trees efficiently in the concrete mat for slope protection.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention finishes weaving predetermined spacing to one layer in the tree planting lattice point opened and arranged, and connects surface textile fabrics and rear-face textile fabrics, and a filler is held in the interior predetermined in the condition of having been laid. The foundation with a wrap While forming said tree planting lattice point in the shape of parallel crosses in the band-like section finished weaving by one layer in the concrete mat for tree planting which enabled it to perform sodding planting at said tree planting lattice point It considers as the nonwoven section made to intersect a front flesh side in piles, without weaving the warp and weft yarn of the range which were surrounded in the shape of [this] parallel crosses, and is characterized by using biodegradability yarn for said weft yarn which crosses in this nonwoven section.

[0009] As for said biodegradability yarn, at this time, considering as polylactic acid fiber yarn is desirable.

[0010]

[Embodiment of the Invention] Hereafter, the gestalt of 1 operation of the concrete mat for tree planting of this invention is explained with reference to an accompanying drawing. Drawing 1 is the block diagram having shown the outline of ***** prepared in the concrete mat 10 for tree planting of this invention. The concrete mat 10 for tree planting of this invention consists of nondegradable yarn and biodegradability yarn. Polyethylene TEREFUTE rate yarn is used as nondegradable yarn. General Oribe 11 is the plain weave which used throwing with a fineness of 1000d (denier). Moreover, the tree planting lattice point 20 consists of the nonwoven section 15 (after-mentioned) and the reinforcing band section 12 of the shape of parallel crosses which lengthened the warp of surface textile-fabrics 11A and rear-face textile-fabrics 11B, and two weft yarn, arranged them so that the nonwoven section 15 might be surrounded, and was made into one layer (R> drawing 2 2 reference). In addition, surface textile-fabrics 11A is shown in drawing 1. The biodegradability yarn (trade name as an example : lactron) which consists of polylactic acid fiber as weft yarn 13 is used in the direction of X of the range of the nonwoven section 15 inserted into the reinforcing band section 12 at this time. With the gestalt of this operation, the non-twisted yarn of 975d / 156 filament is used as weft yarn 13 (biodegradability yarn). As for nondegradable yarn, it is desirable to consider as about [1000d] throwing in consideration of the reinforcement as a filament and the endurance as textile fabrics.

[0011] Drawing 2 shows the type section of ***** of the tree planting lattice point 20. As shown in drawing 2, surface textile-fabrics 11A and rear-face textile-fabrics 11B are woven so that two yarn of a front flesh side may lengthen, it may arrange in the reinforcing band section 12 and a next door and a front rear face may serve as one layer. Moreover, without weaving warp 16 and weft yarn 13 of each other, the nonwoven section 15 is arranged so that it may lap up and down. Since biodegradability yarn is used for weft yarn 13, when biodegradability yarn decomposes with the passage of time, as shown in drawing 3, the nonwoven section 15 is constituted from the gestalt of this operation by only the warp 16 which consists of nondegradable yarn.

[0012] The synthetic fiber which has the endurance of polyester besides the above, a polyamide, polyethylene, etc. as nondegradable yarn can be used suitably. As resin of the polylactic acid fiber which constitutes biodegradability yarn, Pori L-lactic acid, a Pori epsilon-caprolactone, polybutylene succinate, polyethylene terephthalate, etc. are suitable. The yarn with which aliphatic series polyester yarn consists of biotechnology polyester, a biotechnology cellulose, polysaccharide, and polyamino acid as living thing product yarn again is suitable as synthetic macromolecule yarn which constitutes other biodegradability yarn. Moreover, the yarn which consists of a cellulose, chitosan, a lignin, starch, and an alginic acid as natural product yarn is suitable.

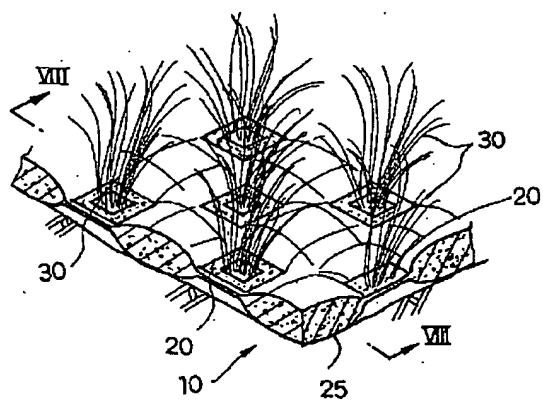
[0013] In addition, biodegradability yarn is used for general Oribe's 11 weft yarn with which it fills up with concrete as well as the nonwoven section 15. Therefore, the weft yarn 13 of this part is also disassembled with the passage of time. However, since concrete has already hardened in the predetermined configuration, even if the biodegradability yarn of a concrete packing fraction is lost, it is satisfactory in any way.

[0014] Next, with reference to drawing 4 - drawing 8, the construction procedure of the concrete mat 10 for tree planting is explained briefly. If the interior of the concrete mat 10 for tree planting laid on the foundation 27 of a slant face is filled up with concrete 25 (or mortar) as shown in drawing 4, as shown in drawing 4, with the gestalt of this operation, parts other than tree planting lattice point 20 arranged alternately will become convex. Then, as shown in drawing 5 and drawing 7, a thin layer thru/or the medium-rise vegetation base material 26 are sprayed on an about 20 tree planting lattice point hollow. If a predetermined period passes since this condition, the biodegradability yarn which constitutes the nonwoven section of this tree planting lattice point 20 will decompose. While the seed contained in the vegetation base material 26 according to this buds, it roots towards a foundation 27 side. Thus, the root of herbs takes root on the foundations, such as a bare field of the concrete mat 10 bottom, through the nonwoven section 15, as shown in drawing 6 and drawing 8. In the growth process of these herbs 30, since the nonwoven section 15 becomes only warp 16, vegetation can fully expect and can cover the concrete mat 10 whole certainly by the herbs 30 which grew in each tree planting lattice point 20. After performing suitable dressing in consideration of the climate of a construction area etc. as seeding vegetation, it is desirable to carry out seeding of the outpatient department herbs, such as creeping red FESUKU (CRF), *Dactylis glomerata* (OG), Kentucky 31 FESUKU (K31F), and the Kentucky bluegrass (KBG). Moreover, native herbs, such as Japanese pampas grass, a Japanese knotweed, and sagebrush, may be made to **** suitably.

[0015] Drawing 7 and drawing 8 show the condition that the condition of having constructed the vegetation base material at the tree planting lattice point 20, and herbs 30 budded from this tree planting lattice point 20, and they grew to the predetermined scale. As shown in each drawing, by using biodegradability yarn for a part of nonwoven section of the tree planting lattice point 20, in this tree planting lattice point 20, a spraying base material can be held immediately after spraying of a vegetation base material, and easy growth of herbs can be urged to it with the passage of time.

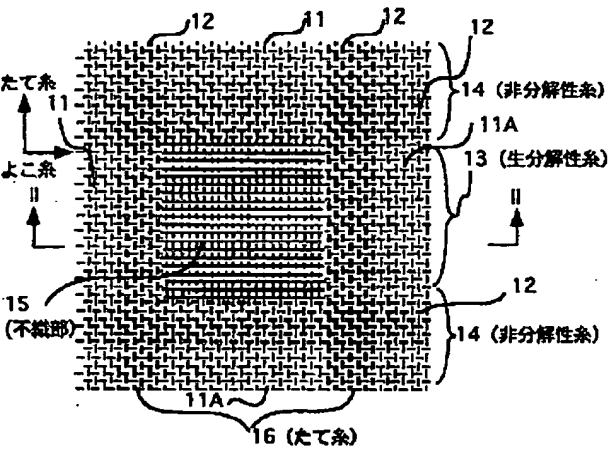
[0016] Drawing 9 is the ** type top view having shown partially the example of arrangement of the tree planting lattice point 20 woven into the textile fabrics of the concrete mat 10. With the gestalt of this operation, the nonwoven section 15 was set as about 50mm per side, the width of face of the reinforcing band section 12 was set as 20mm, and arrangement spacing of the nonwoven section 15 was set to about 230-250mm. It cannot be overemphasized that these dimensions can be suitably set up with the mat thickness at the time of concrete restoration of the concrete mat 10, the number of the tree planting lattice points 20 needed. Moreover, what is necessary is for an arrangement pattern to be also alternate, and also to weave so that it may be made to align in all directions, and just to set up a pattern. By the arrangement pattern of the tree planting lattice point 20 shown in drawing 9 (a), since spacing during the tree planting lattice point 20 is short, growth of herbs with a more high consistency is expectable. Moreover, it is desirable to expect sufficient growth of herbs in the case of the arrangement pattern of the tree planting lattice point 20 shown in (b).

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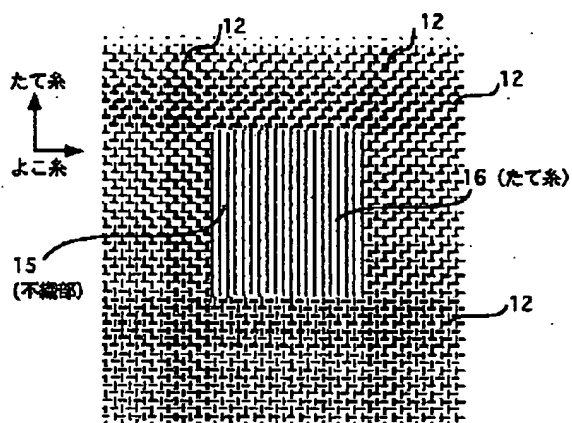
Drawing selection 

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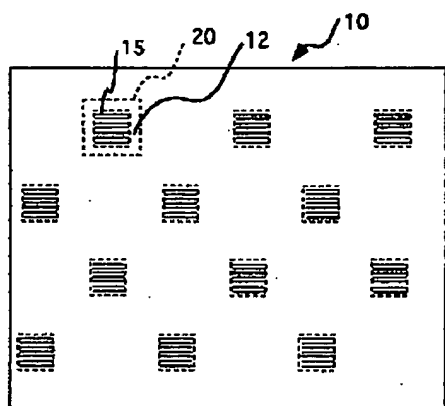
Drawing selection drawing 1



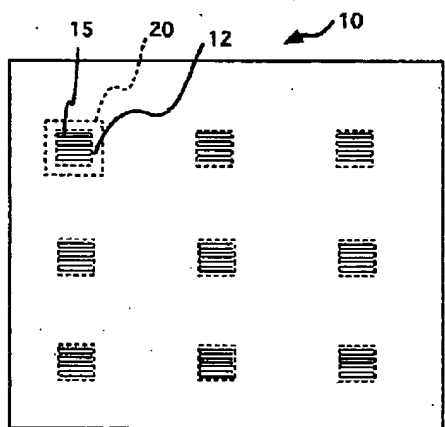
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Drawing selection 

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Drawing selection 

(a)



(b)

[Translation done.]

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